portance of some triple alloys, and on the substitution of pure iron for steel in the formation of alloys.

*Some Observations on the Buffy Coat of the Blood, &c.* *By* John Davy, *M.D. F.R.S.* Read April 18, 1822. [*Phil. Trans.* 1822, *p.* 271.]

The peculiar appearance which the blood sometimes assumes after its coagulation, and which has been termed "buff," has been referred by Mr. Hewson to its increased tenuity and slow coagulation. Dr. Davy is inclined to ascribe the separation of the colouring matter from a part of the coagulum, or diminished viscidity to the former rather than the latter cause; for he has remarked that blood drawn in several inflammatory diseases coagulates with its usual rapidity, and yet forms the buffy coat: its specific gravity also rather exceeds than falls short of that of healthy blood.

Dr. Davy next adverts to the opinion that the age of the morbid adhesions, which on dissection are often found to connect together serous membranes, is proportionate to their strength: but as he has found strong adhesions formed in twenty-four hours between surfaces of the pleura, in consequence of inflammation artificially excited; and as he has remarked a peculiar tenacity in the coagulable lymph of the blood, enabling it to be drawn out into bands and fibres, which become solid and opake, and thus represent ordinary adhesions, he is inclined to doubt the correctness of the above opinion.

Lastly, the author mentions the supposed pouring out of serous fluids into certain cavities, after death; and cites experiments to show that, under ordinary circumstances, no such effusion or exudation of serum takes place.

*On the Mechanism of the Spine.* *By* Henry Earle, *Esq. F.R.S. Surgeon to the Foundling, and Assistant Surgeon to St. Bartholomew's Hospital.* Read April 25, 1822. [*Phil. Trans.* 1822, *p.* 276.]

In examining the structure of the vertebræ in different animals, the author was particularly struck with the mechanism of the spine and spinal canal in birds, by which great motion is gained in the neck without injury to the spinal marrow. The cervical vertebræ in birds vary from 9 to 24 in number; they differ considerably from each other, and are articulated by complex joints, in some respects resembling the articulation of the olecranon with the humerus in the human subject, but admitting also of lateral motion. The varying positions of the articulating surfaces are favoured by the interposition of a cartilage, adapted to the surface of each bone, and inclosed between reduplications of sinovial membrane; each joint is thus double, and resembles the articulation of the human lower jaw. The canal of each vertebra is contracted in the centre, and enlarges above and

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below. In front it is closed by the bodies of the vertebræ; but in the skeleton its posterior part is imperfect, being filled up in the recent state by membrane, and protected by the ligamentum nuchæ.

The author then describes the appearance, on dissection, of the membranes of the spinal marrow, and of the mechanism by which its compression in the various and extensive motions of the neck is prevented; he also adverts to the exact correspondence between the extent of motion permitted, and the size and form of the canal in the human spine, and to some pathological consequences connected with such structure.

Drawings of some of the cervical vertebræ in birds, with a description of their different parts, are annexed to this paper.

*Of the Nerves which associate the Muscles of the Chest, in the actions of Breathing, Speaking, and Expression. Being a Continuation of the Paper on the Structure and Functions of the Nerves. By* Charles Bell, *Esq. Communicated by Sir* Humphry Davy, *Bart. LL.D. P.R.S.* Read May 2, 1822. [*Phil. Trans.* 1822, *p.* 284.]

This paper forms the continuation of that printed in the last volume of the Society's Transactions, by the same author. In the present communication the author proceeds to show that the office of the respiratory apparatus is not confined to the changes produced upon the blood, but that the same actions are employed in subservience to other organs, and that they perform a variety of functions, as in the natural voice in articulate language, and in the expression of passion, as well as in the more familiar acts of smelling, coughing, sneezing, &c.

Having established the proofs of the necessity of a number of remote parts being joined in the performance of these functions, he proceeds to show that there is a distinct class of nerves for this purpose. That these nerves depart from the same column of the spinal marrow, and diverge to all the parts of the frame, which are drawn into consent in the action of respiration.

Proceeding to show the difference betwixt the calm and uniform breathing for the purposes of circulation, and the excited and more irregular actions, as in speaking, singing, coughing, and sneezing, he proves the necessity of certain powerful muscles being brought in as accessories and aids to the common muscles of respiration. He nexts shows that the respiratory nerves are entirely distributed to these accessory muscles.

After tracing these nerves, and disengaging them from their intricate relation with the other nerves, he proceeds, by comparative anatomy, and by experiments, to show that they are respiratory nerves, and that their division cuts off the parts to which they are respectively distributed from participating in the act of respiration.

He takes occasion to show that authors have attended too exclusively to the par vagum, or eighth pair of nerves, which is only the principal or central nerve of an extensive class of nerves, which